

TTY/TDD FORUM - 4

Seeking Solutions to TTY/TDD Through Wireless Digital Systems

**Draft Report .02
(April 15, 1998)**

***April 1 - 2, 1998
Gallaudet University
Washington, DC***

This report will follow the structure of the agenda (included below). The agenda number will be used to precisely identify topics. An additional heading was added to accurately reflect the discussion topics addressed during the forum.

AGENDA

Forum Goal: ***Seeking Solutions to TTY/TDD Through Wireless Digital Systems***

9:00 AM

1. Call to Order & Opening Remarks	Co-Chairs, CTIA/PCIA
2. Introductions and Attendance Roster	Co-Chairs
3. Call for and Numbering of Contributions	Co-Chairs
4. Review & Approve Agenda	Co-Chairs
5. Review & Approve TTY Forum - 3 Summary	Co-Chairs
6. Review TTY Forum <i>Agreements</i>	Steering Committee ¹
7. Review TTY Forum Correspondence	Steering Committee
8. TTY Forum Regulatory and Administrative Issues	CTIA, NAD and Chairs
9. Review / Impacts RE: <i>TTY Consumer Notification</i>	Open Discussion
10. Agreement Statement RE: carriers responsibility for 10/1/98 deadline and dual-mode handsets	Co- Chairs
11. Working Group Reports:	
• Working Group #1/3: Performance of TTY over Voice Services and Coupling. Through Put testing	Wesley Howe Doug Neeley, Chairs
• Working Group #2: TTY via Data Services	Brye Bonner, Chair
12. Define End User Test	Toni Dunne
13. How to Implement TTY Forum Solutions/Proposals	Open Discussion

¹ TTY Forum Steering Committee: Toni Dunne; Billy Ragsdale; Claude Stout; Norm Williams; Jeff Crollick, John Melcher

14. New Business/Next Steps. Develop list of Analog phones and devices best suited for TTY transport	Co-Chairs
15. Next Meeting	
16. Adjournment	

Table of Contents

1. Call to Order & Opening Remarks	4
2. Introductions and Attendance Roster	4
3. Call for and Numbering of Contributions	4
4. Review & Approve Agenda	4
5. Review & Approve TTY Forum - 3 Summary	4
6. Review TTY Forum <i>Agreements</i>	4
7. Review TTY Forum Correspondence	6
8. TTY Forum Regulatory and Administrative Issues	6
9. Review / Impacts RE: <i>TTY Consumer Notification</i>	7
10. Agreement Statement RE: carriers responsibility for 10/1/98 deadline and dual-mode handsets	8
11. Working Group Reports:	8
• Working Group #1/3: Performance of TTY over Voice Services and Coupling. Through Put testing	8
• Working Group #2: TTY via Data Services	9
12. Define End User Test	9
Deliverable/Consensus from TTY Forum-4	10
13. How to Implement TTY Forum Solutions/Proposals	11
14. New Business/Next Steps. Develop list of Analog phones and devices best suited for TTY transport	12
15. Next Meeting	12
16. Adjournment	12
ATTENDANCE ROSTER	13
APPENDIX A - TTY Agreements	
APPENDIX B - Notification Document	
APPENDIX C - TTY Forum Test Completion Matrix	

1. CALL TO ORDER AND OPENING REMARKS

Mary Madigan, PCIA, co-chair, and Jeff Crollick, SCC, sitting in for Ed Hall, CTIA, co-chair, opened the meeting.

2. INTRODUCTIONS AND ATTENDANCE ROSTER

Introductions were made and roster was circulated.

3. CALL FOR AND NUMBERING OF CONTRIBUTIONS

Call for contributions.

Numbering	Name of Contribution	(Agenda Topic #)
TTY/98.04.01.01	- Agenda	(01)
TTY/98.04.01.02	- TTY Forum - 2 Report	(02)
TTY/98.04.01.03	- Agreements Reached at TTY Forums	(06)
TTY/98.04.01.04	- CTIA/PCIA letter to Ultratec	(07)
TTY/98.04.01.05	- Ultratec response letter to CTIA/PCIA	(07)
TTY/98.04.01.06	- Terri Brooks e-mail to Ed Hall and response	(10)
TTY/98.04.01.07	- Tim Jeffries answers to Karl Warfel's questions	(10)
TTY/98.04.01.08	- CTIA Ex Parte to FCC dated March 26, 1998	(08)
TTY/98.04.01.09	- Draft of CTIA letter re: Notification effort	(09)
TTY/98.04.01.10	- Attendance Roster	(02)
TTY/98.04.01.11	- Copy of CTIA Legislative Presentation overheads	(08)
TTY/98.04.01.12	- TTY Forum - 3 Draft Report	(05)
TTY/98.04.02.01	- Illustration of 5% Error Rate on Incoming Conversation	
TTY/98.04.02.02	- Illustration of 3% Error Rate on Incoming Conversation	
TTY/98.04.02.03	- Illustration of 1% Error Rate on Incoming Conversation	

4. REVIEW AND APPROVE AGENDA

Scheduling conflict with FCC Open Meeting for Section 255 NRPM for April 2, 1998. Adjustment to the meeting made to accommodate. Technical members will meet at 9:00 and be joined by legislative and consumer members at 11:00 after the conclusion of the FCC demonstration. Agenda approved.

5. REVIEW AND APPROVE TTY FORUM - 3 SUMMARY

TTY Forum - 3 Report approved with changes from Judy Harkins, Gallaudet.

6. REVIEW TTY FORUM AGREEMENTS

(Note: An "Agreements" page will be attached as an Appendix to all TTY Forum Reports and will provide an on-going record of agreements reached and changes to existing agreements.)

Verify agreement:

- Short term solution - through vocoder
- Long term solution - possibly excludes sending BAUDOT tones through vocoder

Only the TTY Forum may change agreements reached by this body.

New Additions to Agreements Page (see Appendix A for complete list of TTY Forum Agreements):

- 6 sponsored spots for identified consumer groups, relinquished if member misses 2 consecutive meetings.
- Accept modified "readability test" to be used by phone manufacturers to benchmark TTY over digital capabilities, to determine success rate for transport. (See Contribution TTY/98.02.11.06) Two tests: Manufacturers Readability Test, End User Test
- Error rate is defined as "character" not "bit" for the purpose of this forum. (Shift error rate of ratio 1/8 (i.e. 1 shift error causes up to eight text errors and will be counted as such) to be determined)
- Develop User Requirements Document. The outcome of Working Group #2. Represents the effort to provide for future advancements in technology by looking at solutions beyond 45.45 baud, Baudot.
- Define process to update Notification Document: refer updated information to CTIA to be distributed to T-CAT.

FORUM 4:

- **Objective test (Throughput Test) approved and to be sent to manufacturers and carriers with a matrix to record testing completion dates and documentation.**
- **Matrix approved.**
- **Consensus reached that Testing Matrix should go to every manufacturer listed at CTIA as well as Wireless and Wireline Carriers. CTIA/PCIA will send supporting letter requesting participation from all parties, not just those attending the TTY Forum. The group recognizes that participation is voluntary. Copies of letter and matrix responses will be sent to the FCC.**
- **Put RFI on issues list to explore possibility of interference between phone and TTY device.**
- **Consensus to put TTY Forum's current research opinion on output voltages (coupling information) into a formal document and present to manufacturers for feedback. Give 30 days for feedback.**
- **Subjective test (End User Test) to be finalized by committee. Testing will be handled through Gallaudet with assistance from Wireless manufacturers and TTY manufacturers. Will replicate authentic 9-1-1 calls with a deaf/hearing impaired caller and a trained calltaker.**
- **CTIA will produce a list of Analog Phones that are compatible with TTY devices to be included in notification efforts and on web sites.**
- **Gallaudet and Consumer groups will draft a Consumer Requirements Document.**
- **CTIA/PCIA will escalate/elevate TTY Forum efforts to reach wireless equipment manufacturers and inform of urgency and criticality of rapid response to the Testing Matrix.**
- **Work will begin on producing Standards Requirements Documents for**

V.18 and the 2.5 mm jack. Document presented as a Contribution at next TTY Forum.

7. REVIEW TTY FORUM CORRESPONDENCE.

Discussion regarding letter to TTY manufacturers regarding lack of attendance at TTY Forums. Response from Ultratec to CTIA and PCIA expressing disappointment at receiving a letter because they have been participating. Group responded that TTY manufacturer representation was needed at TTY Forum-3 and no TTY manufacturers were present therefore consensus was reached to send letter to all TTY manufacturers.

8. TTY FORUM REGULATORY UPDATES: CTIA, FCC, NAD, TDI

Comments from Ron Netro, FCC:

No new updates from the FCC since December.

Andrea Williams, CTIA:

Presentation:

- Need to focus research efforts and resources in order to meet Oct 1, 1998
- Need short term solution whereby carriers can meet Oct 1, 98 compliance date. Continue work on long-term solutions
- Suggested short-term solution: at least one phone model for each digital technology, i.e., CDMA, TDMA, PCS-1900 (GSM)
- Is this acceptable to Consumer Groups and FCC?
- Issue would the FCC accept ability to provide TTY users with one (or more) model of TTY compatible digital phones by Oct 1 98
- Carriers who can offer TTY users at least one reasonably priced digital model by 10/1/98 would be considered compliant.
- CMRS manufacturers have a separate obligation under 255 with respect to accessibility or compatibility for their products for their users.
- Use quarterly status report as proper mechanism to inform the FCC.
- FCC representation: Wireless Bureau Staff, Observer only

Clarification:

- Digital phone models may not default to analog in order to reach compliance. Dual mode phones are not considered in the digital solution - there must be a digital phone in compliance.
- Due April 10 - next TTY status report - expect to see discussion of new vs. existing digital equipment.
- Requirements for Service Providers to Provide 1 phone per digital technology: Each service provider must offer a phone for each digital technology - GSM, TDMA, CDMA
- Consumer could go to any provider and purchase a phone (digital) to work with the provider's technology
- The significant factor is that each service provider must support TTY on their

technology. It is not acceptable to send a customer to another provider using that technology.

Discussion:

What happens after Oct. 1, 1998? Short-term solution is in place then what time frame exists to ensure that long-term solutions are met.

- Quarterly Report is vehicle to report progress to FCC
- CTIA and PCIA are committed to working with this group as long as needed until work is completed.
- Need to agree on benchmarks. Tell the FCC what is in the works and what can legitimately happen. Working group reports are key to progress.
- Standards groups are the end result so that a Standards Document should be produced to get work to Standards to be worked on and finalized.
- Functions and features are comparable to what? What is the basic sub-set of requirements? One requirement could be vibrate for ringing (including hands-free mode). Note that TTY LED signal requires a wireline phone not wireless.
- Establish "must-have" and "nice-to-have" features with input from consumer groups. Requirements set from there.
- Issue must be clarified. Is a wireless phone connected to TTY unacceptable to a VCO caller because there is no ability to speak into phone when connected to wireless phone?
- **Consumers must provide minimal requirements for wireless for both general and 9-1-1 calling.** Need to know where VCO/HCO caller is located and the problem. The standard PSAP can do BAUDOT or VOICE but not SIMULTANEOUSLY.
- Carriers must take TTY signal by mandate. VCO/HCO is not a requirement even though TTY Forum is dealing with VCO/HCO long-term.
- Who provides the connector between TTY and digital wireless phone? Is it carrier responsibility or TTY manufacturers? Carriers plan to provide cable with the phone. Carriers have responsible people available for assisting with devices.
- Standardization of connection must be undertaken to allow for wide variety of TTY manufacturers to provide equipment. Standard exists for digital cellular TR45.2.xxx and TIA Standard 688

9. REVIEW / IMPACTS RE: TTY CONSUMER NOTIFICATION

Laura Ruby, AT&T Wireless

- Notification strategy included all stakeholders taking message out to consumer. Multi-channels imperative to reach all current and potential customers.
- Possibility of TTY manufacturers to put message on Web site to reach potential customer. All need to talk the same language and be comprehensible to consumers.

- Reached consensus on a uniform message to all consumers to alert them to not purchase a digital phone today to carry TTY signals.
- AT&T Wireless will have TTY message printed on all bills going out to customers. BellSouth also sending message in condensed form for inclusion on all bills to all customers.
- Exact wording of message was discussed and agreed to at the last meeting of the TTY forum.

Discussion:

- Ultratec will have a message that they have written for their Website- www.ultratec.com (specific discussion under EasyLink). Ultratec is linking with Gallaudet's web site and could link to CTIA's wow.com.
- Carriers have printed notice on bill, included inserts in package, made placard for sales offices to reach largest group possible.
- Article in next MD Relay newsletter containing full content of notification text.
- Letter sent from CTIA to consumer organizations containing full text and offering electronic text from CTIA website. Refer to Judy's article. Mailing list from Judy Harkins is in process of being mailed. PCIA will mail letter also.
- Gallaudet offered comments to improve Ultratec's notification wording and Ultratec will entertain these comments.

10. AGREEMENT STATEMENT RE: CARRIER AND MANUFACTURERS RESPONSIBILITY FOR 10/1/98 DEADLINE and DUAL-MODE HANDSETS

See discussion under Agenda Item #8.

11. WORKING GROUP REPORTS:

• WORKING GROUP #1/3

Summary: Group disappointment was expressed at the lack of progress and participation by the manufacturers in completing throughput testing. Consensus was reached to send a letter from the TTY Forum with CTIA/PCIA endorsement urging strong support and effort to complete the testing. The FCC will be apprised of these efforts.

Wesley Howe, GTE Wireless, co-chair presented the Working Group #1/3 report. CDG is going to do throughput testing for CDMA. CDG group members have not heard of this effort. Alan Wolf, chair of subcommittee, is familiar with the issue. No contributions were received from other members of working group. Bell Atlantic is doing testing but does not have anything to report-they are seeing widely varied results. Lucent has begun preliminary testing and will have status report for the next meeting. Lucent is testing the vocoders. Sprint is testing - 110bps ASCII - error rates about 10%, 300bps showed unreasonable error rate. Gallaudet showed mixed results at previous TTY meeting. Motorola is doing testing - no results to report.

Discussion:

- Consensus of TTY Forum that manufacturers need to perform tests and report back results to next meetings. CTIA and PCIA must communicate with manufacturers the need for their support. Set up matrix of manufacturers and results which will be submitted to the FCC and included in TTY Forum report.
- Field testing is required as the second phase of the throughput test. Identify which manufacturers will supply equipment for Gallaudet to do field testing.
- Standards group has been unsuccessful in creating a wireless stress test for modems. Since these are similar issues there may be a problem achieving a test.

Doug Neeley, Ericsson, Interconnection Issues for Working Group #3:

Concern is to provide retrofit to support TTY manufacturers equipment and to work with wireless manufacturers equipment. Upon polling manufacturers, agreed that the 2.5mm jack and short cable would retrofit phones and Ultratec. Voltage changes depending on handset. Identify voltage for TTY to look for. Audio levels are different for model to model, but with AGC circuitry in phone audio will work in the range available. For testing use a standard handset for acoustic coupling. Audex has built a retrofit for about \$80.

Build test to:

- 2.5 mm interface with short cable
- attach conventional handset to provide acoustic coupling
- TTY devices have acoustic coupling, jacks, or both so multiple solutions are required.
- Create a strawman that gives workable point of x dbm for manufacturers.
- TR45.1 analog standard could build standard for analog coupler
- Agreement from Ultratec to provide typical signal levels for both acoustic and RJ solutions. Problem providing standard 2.5 mm connection.

Consensus for Doug Neeley to put researched opinion on output voltages (coupling information) into a formal document and present to manufacturers. Give 30 days for feedback.

• REPORT OF WORKING GROUP #2

Brye Bonner, Motorola, chair,
No report available.

12. DEFINE END USER TEST

Toni Dunn, Texas 9-1-1, chair. Presentation by Judy Harkins, Gallaudet University

--Add presentation--

ADD NOTE on slide for PROCEDURE - conversations are real so they are not necessarily logical.

Discussion:

- Remember that the deaf caller is vulnerable to error because they might type

can't or don't and if there is an error it could appear as can or do. Also making a mistake in the number is dangerous.

- From the Public Safety standpoint there are highly trained calltakers who are trained to verify the information and not just regurgitate to ensure accuracy.
- Are all calltakers across the US trained the same?
- That is a loaded question. There is not uniform required training but NENA and APCO make a national effort to establish standardized high quality training.
- Do a demonstration with Norman Williams software that introduces error and have Al Sonnenstrahl (representing deaf user) and John Melcher (representing PSAP calltaker) send and receive a TTY message
- Technical details: FUTURA TTY III - Norm Williams' software.
- Object of test: to demonstrate what the effect of a bit error rate is in a real situation. From this will follow a discussion of what is acceptable error rate.
- During test at 5% error rate, the calltaker said: "Sending ambulance now." Caller received: "Sending ambulance no." Caller thought no ambulance was coming.
- Comment to drop Baudot as a protocol and use protocol with forward error correction.
- Could we have modem pooling available by Oct 1, 1998?
- Believe we could have a proof of concept model by then.
- No challenge to the concept. But I want to know that when I travel that the modem pool system is available in every city.
- Not necessary - any center that has a public switch could connect to anywhere. Translation is performed by network element. Packet switched data could go to network.
- Nothing has been produced technically to support this concept which we first heard in Sept. So we have concern that Oct 1, 1998 can be met. Would like to know what manufacturer will produce the proof of concept model.

DELIVERABLES/CONSENSUS FROM TTY FORUM

Coupling - Doug Neeley -

- Letter from TTY Forum CTIA/PCIA to Manufacturers requesting help
- SRD document for 2.5 mm interface

Objective Tests

- Throughput test presented at TTY Forum to be used as objective test for equipment manufacturers and carriers. Results to be logged on Matrix.

Subjective Test

- Test to be determined by committee. Gallaudet committed to Field Testing using subjective (End User) test. Requests help of wireless equipment and TTY manufacturers. Will need equipment.

List of Analog Phones Compatible with TTY and Consumer Requirements

- Andrea Williams and Elaine Duff of CTIA will provide Analog Phone List

Consumer Requirements – Consumer groups and Gallaudet will develop.

Letter from TTY Forum and CTIA/PCIA to Manufacturers requesting equipment support to Gallaudet -POC Judy Harkins- with additional support from Ultratec, TTY manufacturers et al.

SRD's to be developed:

- 2.5 mm jack
- V.18

Get back to next TTY Forum with deliverables.

13. HOW TO IMPLEMENT TTY FORUM SOLUTIONS/PROPOSALS

STATUS REPORT for April 10, 1998 submission to the FCC

Proposed Short -Term Solutions

Steps Taken:

- Acoustic Coupling
- Direct Connection
 - 2.5 mm modified
 - Direct Cable (preliminary test results in TTY Forum - 2 Forum Report and contribution TTY/98.02.11.07)
 - Need interface specifications (in progress) TR45 ANSI Standard - 1 yr. process
- 2.5 mm to RJ11 interface (tested). Test Results available for:
 - CDMA
 - TDMA
 - PCS1900
- Acoustic Coupling Demonstration
 - Technology used in demo
 - results of demo
- Throughput Test
 - No results yet
 - Target Date
- TTY via Data Services
 - No report but will follow-up
- Long Term Solution
 - By-pass vocoder
 - Defining a new service - using PDA digital interface (digital TTY)
 - Data Service
- Steps Taken Long Term

- Need V.18 or TTY compatible modem
- Need switchable voice/Baudot
- Stage 0 - Building requirements
 - Objective - define the digital protocol
- Notification Requirements
 - Laura Ruby's Report
- Consumer Groups are not satisfied with progress on testing
 - Want to see test results
 - Do not want testing results included that was not reviewed in the TTY Forum included in the TTY Forum report.

14. New Business/Next Steps.

Minutes will reflect that Ultratec is dissatisfied with the action taken by the group in including their name in the letter to the FCC identifying the lack of participation by the TTY manufacturers. Discussion ensued and motion was made to close discussion. Motion was carried with amendment to ensure efforts to communicate among all participating parties.

15. NEXT MEETINGS

Steering committee, chairs of three working groups, and signatories, will meet for Ad Hoc meeting on June 16, 1998 at Gallaudet.

Next TTY Forum to be held: **May 20-21**
 Followed by TTY Forum on: **July 21-22**

16. ISSUES FOR NEXT MEETING/ADJOURNMENT

Resolve End User Test, analog phones compatible with TTY list, progress of Testing Completion Matrix, SRDs. Adjourn.

ATTENDANCE

NAME	COMPANY	PHONE	FAX	E-MAIL
Baquis, David	SHHH	301-657-2248 301-657-2249(t)	301-913-9413	dbaquis@shhh.org
Barclay, Deb	Lucent	630-979-5660	630-713-6215	d/barclay@lucent.com
Berger, Stephen	Siemens Business Comm Sys	512-990-6417	512-990-6335	stephen.berger@siemens.com
Brandt, Richard	Gallaudet University	908-735-6171	215-790-3208	Brandt@gallaudet.edu
Crollick, Jeff	SCC Communications	813-985-3581	813-985-3582	jeff_crollick@scc911.com
Dunn, Toni	TX 9-1-1 Comm	512-305-6918V/TTY	512-305-6937	tdd@earthlink.net
El-Rayes, Mohamed	Nokia	972-894-5872	972-894-4064	mohamed.el-rayes@ntc.nokia.com
Hall, Lysie	Wallis & Assoc	410-489-2808	410-489-2806	lysie@erols.com
Harkins, Judy	Gallaudet University	202-651-5257	202-651-5476	jeharkins@gallaudet.edu
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Lanter, Todd	PCIA	703-939-0300	703-836-1608	lantert@pcia.com
Madigan, Mary	PCIA	703-739-0300 x3011	703-836-1608	Madiganm@pcia.com
McClarren, Don	Philips Consumer Comm	6732-878-8414	736-463-6863	dmcclarren@lucent.com

Melcher, John	Grt Harris Cty 9-1-1, NENA, APCO	713-625-9911	713-864-9911	Jmelcher@911. org
Moller, Paul	Motorola	847-523-5210	847-523-8872	paul- moller@css.mo t.com
Neeley, Doug	Ericsson	972-583-0562	972-583-1809	doug.neeley@e ricsson.com
Netro, Ron	FCC	202-418-0608	202-418-7247	Rnetro@fcc.go v
Parker, Virginia	Qualcomm Inc.	619-658-4789	619-651-8962	vparker@qualc omm.com
Peltz-Strauss, Karen	NAD	301-587-7466	301-587-1234	kpstrauss@aol. com
Ruby, Laura	AT&T Wireless Services	425-828-1354	425-828-8452	laura.ruby@att ws.com
Schultz, Ron	Ultratec	608-238-5400	608-238-3008	Rschultz@ultrat ec.com
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Stout, Claude L.	Telec. for the Deaf, Inc.	301-589-3786 (V)	301-589-3797	tdiexdir@aol.co m
Thomas, Al	Bellsouth Cellular	404-713-0361	404-713-0361	Al.thomas@bsc c.bls.com
Whritenour, Lee	Bell Atlantic Mobile	908-306-6485	908-306-6489	lwhrite1@mobil e.bam.com
Williams, Andrea	CTIA	202-736-3215	202-785-8203	awilliams@ctia. org
Wliams, Norman	Gallaudet University	202-651-5257	202-651-5476	nswilliams@gall audet.edu

APPENDIX A

AGREEMENTS REACHED AT TTY FORUM - 1

- "Solve for 45.45 Baudot, not to preclude looking for other solutions."
- Look for long term and near term solutions.
 - Near term - send through vocoder
 - Long term - circumvent vocoder, enhance quality and connectivity
- Provide for the analog function of wireless phones.
- The only body that can change the agreements reached is this body. All agreements remain intact until/unless action is taken in this forum.

AGREEMENTS REACHED AT TTY FORUM - 2

- Combine Working Group #1 and Working Group #3. Develop new set of deliverables based on the October 1, 1998 deadline.
 - Short term solution: solve for backward compatibility.
 - Develop Standard Test to measure error rate of TTY over digital.

AGREEMENTS REACHED AT TTY FORUM - 3

- 6 sponsored spots for identified consumer groups, relinquished if member misses 2 consecutive meetings.
- Accept modified "readability test" to be used by phone manufacturers to benchmark TTY over digital capabilities, to determine success rate for transport. (See Contribution TTY/98.02.11.06) Two tests: Manufacturers Readability Test, End User Test
- Error rate is defined as "character" not "bit" for the purpose of this forum. (Shift error rate of ratio 1/8 (i.e. 1 shift error causes up to eight text errors and will be counted as such) to be determined)
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- Define process to update Notification Document: refer updated information to CTIA to be distributed to T-CAT.

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- Objective test (Throughput Test) approved and to be sent to manufacturers and carriers with a matrix to record testing completion dates and documentation.
- TTY Forum Test Completion Matrix approved.
- Consensus reached that Testing Matrix should go to every manufacturer listed at CTIA as well as Wireless and Wireline Carriers. CTIA/PCIA will escalate/elevate TTY Forum efforts to reach wireless equipment manufacturers and inform of urgency and criticality of rapid

response to the Testing Matrix via a letter from the TTY Forum and CTIA/PCIA. The group recognizes that participation is voluntary. Copies of letter and matrix responses will be sent to the FCC.

- RFI will be put on issues list to explore possibility of interference between phone and TTY device.
- Consensus to put TTY Forum's current research opinion on output voltages (coupling information) into a formal document and present to manufacturers for feedback. Give 30 days for feedback.
- Subjective test (End User Test) to be finalized by committee. Testing will be handled through Gallaudet with assistance from Wireless manufacturers and TTY manufacturers. Will replicate authentic 9-1-1 calls with a deaf/hearing impaired caller and a trained calltaker.
- CTIA will produce a list of Analog Phones that are compatible with TTY devices to be included in notification efforts and on web sites due as a Contribution at the next TTY Forum.
- Gallaudet University and Consumer groups will draft a Consumer Requirements Document due as a Contribution at the next TTY Forum.
- CTIA/PCIA will send letter to wireless equipment manufacturers requesting that they support Gallaudet University in their testing efforts by sending equipment.
- Standards Requirements Documents (SRD) due for V.18 and the 2.5 mm jack as Contributions at next TTY Forum.

APPENDIX B

Recommended Text

ATTENTION TTY USERS

Background

A TTY (also known as a TDD or Text Telephone) is a telecommunications device that allows people who are deaf, hard of hearing, or have speech or language disabilities to communicate by telephone. A TTY has a keyboard used to type a conversation, which then is transmitted as tones over a wired telephone line. The tones are translated to text that appears on a person's TTY screen.

911 and TTY Access Through Wireless Services

Federal law requires the telecommunications industry to provide a way for TTYs to communicate through **wireless systems** to make 911 calls. There are two types of wireless phones – analog and digital.

- Analog – It is possible today to use some analog wireless phones reliably to call 911 with a TTY.
- Digital – It is not possible today to use a digital wireless phone reliably to call 911 with a TTY.

Research is being done to improve the ability of digital phones to work reliably with TTYs. The industry is working to resolve this matter by October 1998.

[Optional: For more information, contact . . .]

DATE OF PUBLICATION:

APPENDIX C

TTY Forum Testing Completion Matrix

Enter completion date and document reference number for each column

Company	Technology (key specs)	Coupling	TTY Forum Throughput Test (Lab Test)	End User Test (Field Test) Provide Equip for Test
EXAMPLE:				
Bell Atlantic Mobile	CDMA, 800MHZ	preliminary 3/20	preliminary 3/30	10/22/97
Bell Atlantic Mobile	Analog, 800MHZ	preliminary 3/20	preliminary 3/30	10/22/97

APPENDIX G

TTY Forum

Seeking Solutions to TTY/TDD Through Wireless Digital Systems TTY/TDD FORUM - 5

Draft Report .02
(June 10, 1998)

May 20-21, 1998
Washington, DC

AGENDA

Forum Goal: *Seeking Solutions to TTY/TDD Through Wireless Digital Systems*

1. Call to Order & Opening Remarks	Co-Chairs, CTIA/PCIA
2. Introductions and Attendance Roster	
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6. Review TTY Forum <i>Agreements</i>	
7. Review TTY Forum Correspondence	
8. TTY Liaison Reports Updates: <i>FCC; CTIA; NAD; TDI</i>	Appropriate Reps
9. Anti – Trust Comments	Mike Altschul
10. New Agreement Statements RE: <i>Carrier and Manufacturer Responsibilities as of 10/1/98</i>	
11. Analog Phones and Devices <ul style="list-style-type: none"> • Presentations- Lober and Walsh Engineering Sendele Wireless Solutions Inc. • Analog Phone / TTY Devices List 	Joshua Lober Steve Sendele CTIA
12. Working Group Reports <ul style="list-style-type: none"> • Working Group #1/3: TTY over Voice Services and Coupling. <ul style="list-style-type: none"> • Through Put Testing • Update Matrix • Review Draft SRD - 2.5mm jack • Working Group #2: TTY via Data Services <ul style="list-style-type: none"> • Presentation – Motorola • Presentation – DSPG Ltd. • Review Draft SRD – V.18 	Wesley Howe Doug Neeley, Chairs Brye Bonner, Chair George Skorkowski
13. Discuss and Define <i>End User Test</i>	Toni Dunne/Judy Harkins
14. Identify possible work effort regarding interference between phones and TTY devices.	
15. Review Consumer Requirements Document	
16. SEC 255 NPRM	Karen Peltz-Strauss
17. New Business/Next Steps.	
18. Next Meeting	
19. Adjournment	

Table of Contents

1. Call to Order & Opening Remarks	4
2. Introductions and Attendance Roster	4
3. Call for and Numbering of Contributions	4
4. Review & Approve Agenda	4
5. Review & Approve TTY Forum - 4 Summary	4
6. Review TTY Forum <i>Agreements</i>	5
7. Review TTY Forum Correspondence	5
8. TTY Liaison Reports Updates: <i>FCC, CTIA, NAD, TDI</i>	5
9. Anti-Trust Comments	5
10. New Agreement Statement RE: <i>Carrier and Manufacturer responsibility for 10/1/98 deadline and dual-mode handsets</i>	7
11. Analog Phones and Devices Presentations – <ul style="list-style-type: none"> • Lober and Walsh Engineering • Sendele Wireless Solutions Inc. • Analog Phone/TTY Devices List 	8
12. Working Group Reports <ul style="list-style-type: none"> • #1/3: Performance of TTY over Voice Services and Coupling. Through Put testing <ul style="list-style-type: none"> • Throughput Testing • Update Matrix • Review Draft SRD – 2.5 mm jack • Working Group #2: TTY via Data Services <ul style="list-style-type: none"> • Presentation – Motorola • Presentation DSPG Ltd. • Review Draft SRD – V.18 	10
13. Discuss and Define <i>End User Test</i>	14
14. Identify possible work effort regarding interference between phones and TTY devices	15
15. Review Consumer Requirements Document	15
16. SEC 255 NPRM	15
17. New Business /Next Steps	16
18. Next Meeting	16
19. Adjournment	16
ATTENDANCE ROSTER	17
APPENDIX A - TTY Agreements	
APPENDIX B - Notification Document	
APPENDIX C – TTY Forum Test Completion Matrix	

1. CALL TO ORDER AND OPENING REMARKS

Mary Madigan, PCIA, and Ed Hall, CTIA, co-chairs, opened the meeting.

2. INTRODUCTIONS AND ATTENDANCE ROSTER

Introductions were made and roster was circulated.

3. CALL FOR AND NUMBERING OF CONTRIBUTIONS

Call for contributions.

<u>Numbering</u>	<u>Name of Contribution</u>	<u>(Agenda Topic #)</u>
TTY/98.05.20.01-	Agenda	(01)
TTY/98. 05.20.02 -	Roster	(02)
TTY/98. 05.20.03 -	Initial TTY Report (testing results)	(12)
TTY/98. 05.20.04 -	Testing Completion Matrix	(12)
TTY/98. 05.20.05 -	CTIA/PCIA letter to Manufacturers	(07)
TTY/98. 05.20.06 -	Draft SRD for 2.5 mm jack	(12)
TTY/98. 05.20.07 -	CTIA letter to FCC	(08)
TTY/98. 05.20.08 -	TTY/TDD Forum - 4 Draft Report	(05)
TTY/98. 05.20.09 -	CTIA memo to Manufacturers	(08)
TTY/98. 05.20.10 -	Lucent CDMA Testing Report	(12)
TTY/98. 05.20.11 -	Draft User Requirements letter	(10)
TTY/98. 05.20.12 -	TTY Throughput Test	(12)
TTY/98. 05.20.13 -	Quarterly Status Report	(08)
TTY/98. 05.20.14 -	Sendele Wireless Solutions Presentation	(11)
TTY/98. 05.20.15 -	Summary of Section 255 NPRM	(16)
TTY/98. 05.20.16 -	Draft SRD for Circuit Switched Data	(12)
TTY/98. 05.20.17 -	Nokia Preliminary Testing Results	(12)
TTY/98. 05.20.18 -	Anti-Trust Checklist	(09)
TTY/98. 05.20.19 -	Excerpt from ITU article	
TTY/98. 05.20.20 -	Motorola Preliminary Testing Results	(12)
TTY/98. 05.20.21 -	no document - error in numbering	
TTY/98. 05.20.22 -	DSPG Presentation on V.18	(12)

4. REVIEW AND APPROVE AGENDA

Move Agenda Topic 16 to Day 1 after Agenda Topic 10. Add Throughput to Working Group #2. Add Review and Amend Agreements to Day 2. Agenda approved.

5. REVIEW AND APPROVE TTY FORUM - 4 SUMMARY

Sprint and Ericsson asked for time to review report. Paper copies distributed to be reviewed and approved at next meeting.

6. REVIEW TTY FORUM AGREEMENTS

(Note: An "Agreements" page is attached as an Appendix to all TTY Forum Reports and provides an on-going record of agreements reached and changes to existing agreements.)

Discussion regarding existing Agreements which have been changed by subsequent agreements. Agreement to review all existing agreements at next TTY Forum and update to reflect current standing. Agreements reached at TTY Forum -5 are at the head of Appendix A.

7. REVIEW TTY FORUM CORRESPONDENCE

Correspondence was sent to manufacturers requesting cooperation in keeping TTY Forum informed of progress and efforts and to join the TTY Forum, if possible. Throughput Test was attached to document to provide standardized test for manufacturers. The list represents the manufacturer membership of PCIA and CTIA. Comments from Christopher Kingdon, Ericsson, stated that the Throughput test can not be used to compare air interfaces. Response from the chair stated that this test is designed as a benchmark for each separate technology and not intended to compare technologies. Additional comment that the throughput test should have gone out to the wireless and wireline carriers. Letter will go out at the end of this week to all members of CTIA and PCIA and members of the Forum. Wesley Howe will be added as the point of contact for all technical questions. Letter will state that this throughput test is a starting point and benchmark not the only test possible.

8. TTY Liaison Report Updates: CTIA, FCC, NAD, TDI

No additional reports were shared. Refer to group participation in the agenda topics.

9. ANTI-TRUST Comments

Andrea Williams, CTIA

Antitrust Checklist

- All standards should be voluntary
- Where possible, development of performance standards is favored over specification or design standards that might limit variety or quality of service or product.
- Don't discuss or exchange information concerning;
 - Prices, price changes, price differentials, mark-ups, discounts, allowances, credit terms, commissions, etc.
 - Individual company figures on costs, capacity, sales, etc.
 - Plans of individual carriers and manufacturers concerning the pricing and marketing of new services or equipment.
 - Any matter that might have the effect of excluding vendors, agents, distributors, or resellers from any wireless market or service.

Guidance from FCC Wireless Bureau

ISSUE: Whether the FCC would accept as a short term solution, CMRS carriers